

## REMARKS

Entry of the amendments to the specification, claims and abstract before examination of the application is respectfully requested. These claims patentably define over the art of record.

If there are any questions regarding this Preliminary Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 095309.57328US).

Respectfully submitted,



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Safety system for operating at least one electrically operated locking device of a vehicle

BACKGROUND AND SUMMARY OF THE INVENTION

**[0001]**      This application claims the priority of German patent document 103 34 711.9 filed July 30, 2003 (PCT International Application No. PCT/EP2004/008140, filed July 21, 2004), the disclosure of which is expressly incorporated by reference herein.

**[0002]**      The invention relates to a safety system for operating at least one electrically operated locking device of a vehicle. ~~, according to the precharacterizing clause of claim 1.~~

**[0003]**      German patent document DE 27 51 821 A1 describes an automatic safety system for vehicles which is controlled by a driver's reflex. At a certain degree of operation of the brakes, among other things the doors are automatically locked, so that, in the event of a crash (impact), the occupants are not hurled out of the vehicle.

**[0004]**      German patent document DE 199 06 049 A1, on the other hand, discloses a method for operating an electrically operated locking device [[of]] for a glove compartment flap, in which the electric opening release of the locking device is dependent on sensor values ~~which~~ that are related to the driving

situation or are related to an event. In this case, the opening ~~release~~ of the locking device can be suppressed for a certain period of time following a driving-critical situation. ~~[[An]]~~ In this manner, an inadvertent opening ~~operation~~ in the event of a crash, which ~~operation~~ involves an increased risk of injury, can therefore be avoided.

**[0005]** ~~[[The]]~~ One object of the invention is to provide ~~based on the object of specifying~~ a safety system for operating at least one electrically operated locking device of a vehicle, which ensures that the occupant is protected against ~~[[an]]~~ unintentional opening operation from the outside.

~~The object is achieved by a safety system for operating at least one electrically operated locking device of a door of a vehicle with the features of claim 1.~~

**[0006]** ~~According~~ This and other objects and advantages are achieved by the safety system according to the invention, ~~[[the]]~~ in which electric opening ~~blockage~~ of the locking device is blocked based ~~depends~~ on sensor values which are related to the driving situation, and which indicate an impact. In this case, the safety system is provided for operating at least one electrically (or ~~[[else]]~~ fluidically) operated locking device of a door of a vehicle. This avoids the unintentional opening of vehicle body ~~elements~~ components, in particular of doors, due to acceleration forces or accident-induced actions during a hazardous situation. The body ~~elements~~ components in particular also comprise rear wall doors, flaps and lids. The occupants are prevented from unintentionally leaving

the vehicle and are protected from external, endangering actions. The electric opening ~~blockage~~ cannot be influenced by the driver.

**[0007]** In a refinement ~~in which~~ the electric opening ~~blockage as a function~~ is suppressed in response to occupation of a seat, ~~and being occupied~~ can be activated only for the locking devices of those body elements components (advantageously the door tailgate or a rear door of the vehicle) which are adjacent to the occupant, ~~it is advantageous if the door is a tailgate or a rear door of the vehicle. A complete blockage of the access possibilities to the vehicle is avoided by~~ By activating the suppression of the dependency of the electric opening blockage on being activated as a function of the seat being occupied, complete suppression of access to the vehicle is avoided.

**[0008]** Only the locking devices of those doors which are situated in the immediate, reachable region surrounding the occupants are activated by the electric opening blockage, and blocked during the hazardous situation.

**[0009]** ~~It is advantageous if~~ Advantageously, the electric opening ~~blockage suppression~~ as a function of a hazardous situation can be activated only for the locking devices of those vehicle body elements components which are ~~to be regarded as~~ relevant to the safety of the occupants in the hazardous situation. In this case, the electric opening blockage of the locking device can take place as a function of the speed, the acceleration and/or a rate of rotation of the vehicle. ~~An individual protection~~ Protection of an individual occupant is ensured as a function of the hazardous situation present, with only the doors most necessary

for comprehensive protection of the occupants being activated by the electric opening blockage, over the course of the hazardous situation.

~~Further advantageous refinements of the invention are specified in the subclaims.~~

[0010] Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] ~~The invention is explained in more detail with reference to an exemplary embodiment in the~~ single figure is a schematic block diagram of, ~~the figure showing, in an excerpt,~~ a safety system for operating electrically operated locking devices of a vehicle ~~in a diagrammatic representation.~~

#### DETAILED DESCRIPTION OF THE DRAWINGS

[0012] ~~[[The]] Referring to the Figure, the~~ safety system 1 ~~(illustrated in the figure)~~ according to the invention, for operating electrically operated locking devices 2 to 4 of a vehicle ~~(not illustrated specifically shown)~~ has a control device 5 with which the locking devices 2 to 4 can be activated. ~~[[One]]~~ Each locking device 2 to 4 ~~in each case~~ is a functional component of an outer body element of the vehicle. The body elements are, for example, doors 6, tailgate 7 or rear door 8 of the vehicle. However, other components of the vehicle which can be opened

from the outside and the opened state of which could limit the safety of an occupant in a hazardous situation, are also suitable.

**[0013]**      ~~An electric~~ Electric opening ~~blockage~~ of the locking device 2 to 4 ~~takes place~~ is blocked as a function of sensor values which are related to the driving situation, and which indicate an impact. For this purpose, the control device 5 is activated by a sensor 9 for measuring the speed of the vehicle, ~~[[by]]~~ a sensor 10 for measuring the acceleration of the vehicle, ~~[[by]]~~ a sensor 11 for measuring a rate of rotation of the vehicle, ~~[[by]]~~ sensors 12 for detecting ~~[[the]]~~ seat occupancy in the vehicle, and ~~[[by]]~~ a sensor 13 for detecting an accident situation of the vehicle~~[[,]]~~ (in particular, a crash sensor, an image-providing sensor or a radar sensor). The ~~opening blockage by means of the~~ control device 5 can ~~take place~~ suppress opening as a function of the signal of a sensor 9 to 13, or ~~else in a~~ combination of a plurality of such sensors 9 to 13, (with it being possible for the combination to take place, for example, by means of a functional logic operation). In addition, however, other sensors ~~9 to 13~~ for sensing sensor values ~~which~~ that are related to the driving situation or are related to an event~~[[,]]~~ (such as, for example, a distance sensor) ~~[[,]]~~ may also be provided.

**[0014]**      In a refinement of the invention, ~~[[the]]~~ electric opening can be blocked ~~blockage~~ as a function of ~~[[the]]~~ seat occupancy; that is, it can be limited to ~~can be activated only for~~ the locking devices of those doors 6 and tailgate 7 or rear door 8 of the vehicle which are adjacent to the occupant. For example, in the case of a four-door sedan, ~~it is appropriate,~~ if the front seats are occupied, ~~[[only]]~~ it is appropriate to activate only the two doors 6 in the front region of the interior

of the vehicle by the electric opening blockage. ~~In the case of an additional occupancy of~~ If the rear seats are occupied, electric opening of, the two rear doors 6 of the vehicle would also ~~additionally have need~~ need to be activated by the ~~electric opening blockage to provide a blockage~~ blocked during the hazardous situation.

**[0015]** ~~Owing to the fact that~~ The electric opening blockage system according to the invention inhibits opening of only the minimum ~~necessary~~ number of external body elements ~~are blocked~~ that is necessary to ensure the safety of the occupants in a hazardous situation. ~~by the electric opening blockage in order to ensure the safety of the occupants, it is ensured that,~~ In this manner, after an accident and a possible failure of the electric closing and opening functions, access to the vehicle is nevertheless ensured (or the occupants can leave the vehicle independently), since not all access possibilities are blocked by the electric opening blockage.

**[0016]** In a further refinement of the invention, ~~[[the]]~~ electric opening ~~blockage is suppressed~~ as a function of a hazardous situation, ~~can be activated~~ only for the locking devices 2 to 4 of those body elements which are ~~to be regarded as relevant to the safety of the occupants in the hazardous situation present. This means [[that]], for example,~~ that in the case of a sharp rotation of the vehicle, due to the whirling and centrifugal forces ~~in effect~~, only the door 6 on the outer side of the curve is ~~blocked~~ inhibited by the electric opening blockage. In -and, in the case of an additional occupancy of one or more rear seats, ~~[[also]]~~ the corresponding rear door 6 is also blocked by the electric opening blockage. In



the case of a typical rear end collision ~~accident~~ (which takes place directly from the rear), if appropriate ~~not one~~ none of locking ~~device~~ devices 2 to 4 of the body elements would ~~[[have]]~~ need to be activated by the electric opening blockage. A changing of the current state of the electric opening blockage for the various body elements over the course of the hazardous situation as a function of the movement state of the vehicle is likewise possible.

**[0017]** ~~In the case of the~~ The suppression of electric opening blockage, this state can be maintained for a period of time that is either ~~The period of time for maintaining it may comprise a~~ predetermined length of time or else may be variable as a function of the current values of the sensors 9 to 13.

**[0018]** ~~With the~~ The safety system 1 according to the invention for operating electrically operated locking devices 2 to 4 of the vehicle, ensures ~~[[a]]~~ comprehensive protection for vehicle occupants during and after a hazardous situation ~~is ensured for the occupants~~. During the hazardous situation, ~~an unintentional leaving of the vehicle by~~ involuntary ejection of the occupants is prevented, ~~[[with]]~~ and it ~~additionally being~~ is also ensured that ~~subsequently an~~ subsequent access to the vehicle from the outside is possible, or that the occupants can leave the vehicle by themselves. The vehicles are generally equipped ~~as standard~~ with the sensors 9 to 13 as standard items, so that the safety system 1 can be realized cost-effectively with only a little small outlay.

**[0019]** The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed



embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.